IQ-RPT

REFERENCE MANUAL

Crown Bus Signal Repeater

E106377

Applies only to 120 VAC, North American units.

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THREE YEAR FULL WARRANTY

WORLDWIDE

SUMMARY OF WARRANTY

The Crown Audio Division of Crown International, Inc., 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown[1] product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Crown Warranty.

[1] *Note: If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.*

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service not later than ninety (90) days after expiration of the warranty period. All components must be shipped in a factory pack. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

No action to enforce this Crown Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS.

9/90

Telephone: 219-294-8200. Facsimile: 219-294-8301

NORTH AMERICA

SUMMARY OF WARRANTY

The Crown Audio Division of Crown International, Inc., 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service not later than ninety (90) days after expiration of the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. **SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS.

9/90

Telephone: 219-294-8200. Facsimile: 219-294-8301

The information furnished in this manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance. If you need special assistance beyond the scope of this manual, please contact our Technical Support Group.

Crown Audio Division Technical Support Group

Plant 2 SW, 1718 W. Mishawaka Rd., Elkhart, Indiana 46517 U.S.A.

Phone: **800-342-6939** (North America, Puerto Rico and Virgin Islands) or 219-294-8200

Fax: 219-294-8301 Fax Back (North America only): 800-294-4094 or 219-293-9200

Fax Back (International): 219-294-8100 Internet: http://www.crownintl.com

WARNING

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE!

PLEASE NOTE

The following universal symbols may appear on your product and/or in various sections of this manual. Wherever they appear, they are to be interpreted as follows:

Lightning Bolt Symbol:

This symbol is used to alert the user to the presence of dangerous voltages and the possible risk of electric shock.

Exclamation Mark Symbol:

This symbol is used to alert the user to refer to the instruction manual for important operating or maintenance instructions.

FCC Class A Compliance

This equipment has been tested and found to comply with the limits for Class A Digital Device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: For a system to comply with FCC rules, all components in the system must be in compliance. Please consult the instruction manuals of all components in an IQ System for FCC compliance.

CONTENTS

1 Welcome ____ **5**

2 Installation ____ **6**

2.1 Power Connection ____ 6

2.2 Connecting the Crown Bus ____ 6

3 Operation ____ **7**

4 Specifications ____ **7**

5 Service ____ **8**

5.1 Worldwide Service ____ 8

5.2 North American Service ____ 8

5.2.1 Service at a North American Service Center ____ 8

5.2.2 Factory Service ____ 8

ILLUSTRATIONS

1.1 *IQ Repeater* ____ 5

1.2 *An IQ System* ____ 5

1.3 *An IQ System with an IQ Repeater* ____ 5

2.1 *A 5,000-foot Crown Bus Loop* ____ *6*

2.2 *Connecting Bus Loop, Din to Din* ____ *6*

2.3 *Connecting Bus Loop, Din to Bare Wire* ____ *6*

2.4 *Connecting Bus Loop, Bare Wire to Din* ____ *6*

3.1 *Front View* ____ *7*

3.2 *Back View* ____ 7

Fig. 1.1 IQ Repeater

1 Welcome

The *IQ-RPT* repeater helps an IQ System® go the extra mile by increasing the length of a Crown Bus loop. It does this by reconstructing the data signal to prevent its degradation. With a Repeater in a system, 1,000 feet (305 meters) or more can typically be added to the operating distance of a Crown Bus. And because more than one repeater can be used on each loop, the potential is impressive.

The Crown Bus is a serial communication loop designed to transmit IQ commands and data. As implemented in the *IQ-RPT*, it is a 20-milliamp current loop operating at 38,400 baud. To function properly, Crown Bus loops must be unbroken.

The *IQ-RPT* works with all currently available Crown Bus interfaces. These interfaces include the *IQ-PSI* with one Crown Bus loop, the *IQ-DRN-16* with two loops and the *IQ-INT II* with 8 loops. IQ mixers (including the *MPX-6*, *SMX-6* and *AMB-5*) also have a single-loop Crown Bus interface. Figure 1.2 shows an *IQ-INT II* with two connected Crown Bus loops.

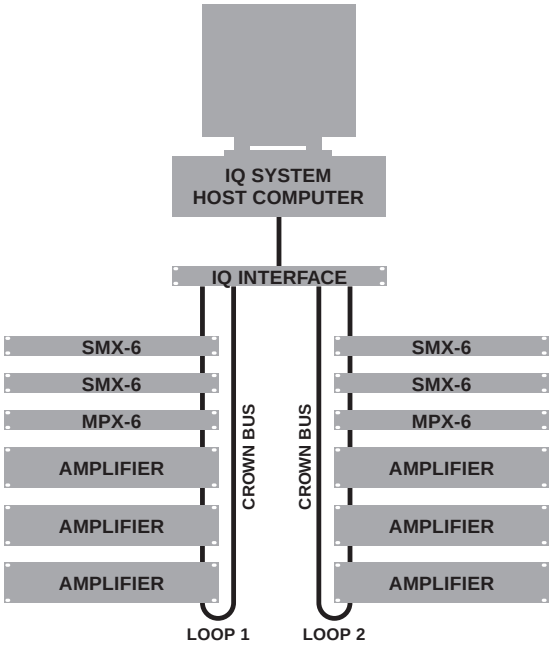


Fig. 1.2 An IQ System

The *IQ-RPT* will typically extend a Crown Bus current loop by 1,000 feet (305 meters) or more. Up to 57 repeaters can be added to a single loop, so total loop distance my reach 58,000 feet (17.7 kilometers). That's almost 11 miles! Figure 1.3 shows a system with an *IQ-INT II* and repeater on its first Crown Bus loop.

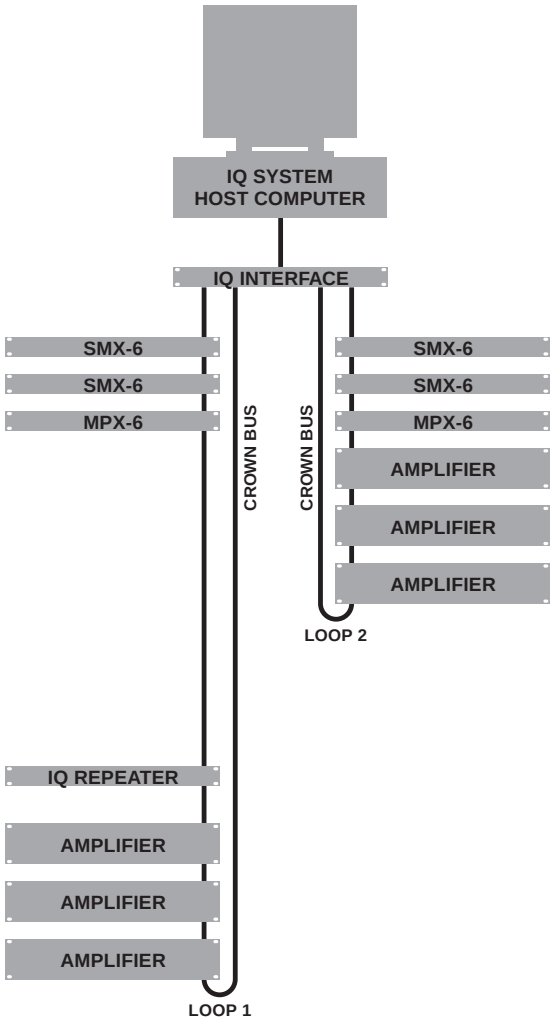


Fig. 1.3 An IQ System with an IQ Repeater

2 Installation

The installation of an IQ Repeater can be divided into two parts: power connection and Crown Bus connection.

2.1 Power Connection

The IQ Repeater operates in one of two power settings. The 115 VAC setting is for operation from 100 to 120 VAC. Operation from 220 to 240 VAC uses the 230 VAC setting. The Repeater is factory set to the correct setting for the country to which it is shipped. Simply plug the correct power cord into the Repeater and an appropriate electrical outlet. Should the Repeater require a different power setting than the factory setting, contact qualified service personnel.

2.2 Connecting the Crown Bus

IQ Repeaters are recommended at every point the Crown Bus exceeds 1,000 feet (305 meters). However, loops in excess of 2,000 feet (610 meters) are possible without the use of a Repeater. The stringent characteristic determining mazimum bus length is loop capacitance. Each loop should have less than 40 nanofarads of capacitance. Adding IQ Repeaters divides the bus loop into sections, each of which can then have 40 nanofarads of capacitance. (see Fig. 2.1.). When calculating bus capacitance, use the capacitance-per-foot rating of the loop wire and add 60 picofarads per IQ component.

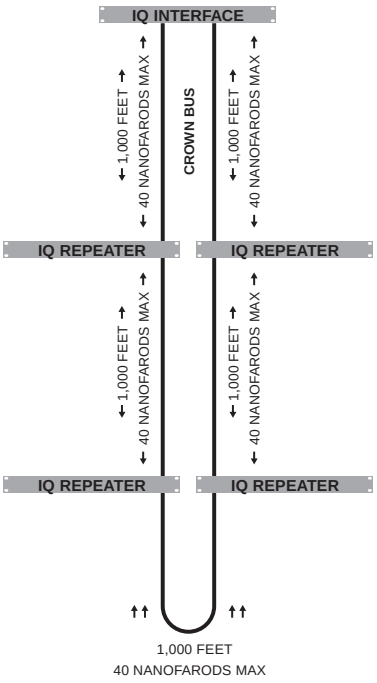


Fig. 2.1 A 5,000-foot Crown Bus Loop.

There are several connectors used for Crown Bus wiring, including DIN connectors and other bare wire connectors. The IQ Repeater uses a 5-pin DIN for input and a 4-pin DIN for the output. See Fig. 2.2 to connect IQ components with DIN Connectors. Figure 2.3 and 2.4 illustrate how to connect IQ components with DIN and barrier block connectors.

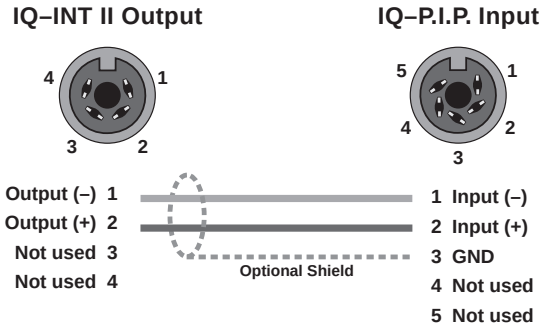


Fig. 2.2 Connecting Bus Loop, DIN to DIN.

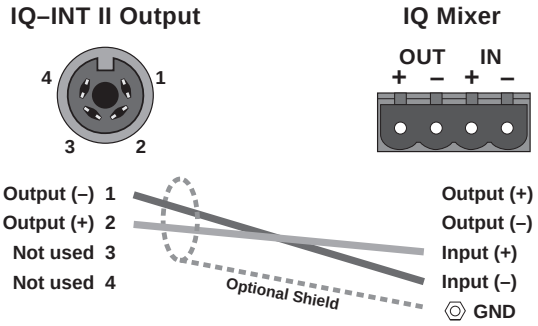


Fig. 2.3 Connecting Bus Loop, DIN to 4-Pin Eurostyle Removable Barrier Block.

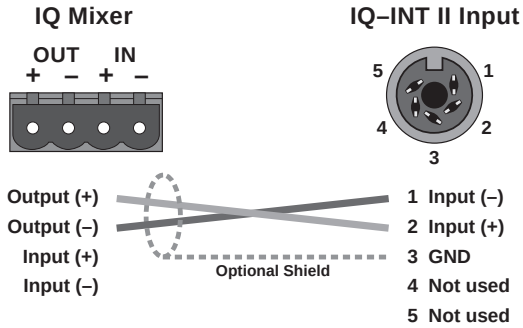


Fig. 2.4 Connecting Bus Loop, 4-Pin Eurostyle Removable Barrier Block to DIN.

3 Operation

There isn't much to operating an *IQ-RPT*. Just plug it in and it works. The operating environment should be free of salt and moisture with temperatures between 32° and 158° farenheit (0° to 70° celsius).

Fig. 3.1 Front view.

Fig. 3.2 Back view.

To help with troubleshooting, the Repeater provides several indicators that are described next.

Power: This amber front panel LED lights to show that the unit is receiving AC power.

Input Status: This green front panel LED flashes when incoming data is received.

Output Status: This yellow front panel LED flashes when outgoing data is sent. It does not indicate the status of the output cabling.

Output Continuity: This red back panel LED lights when there is a connection between the output of the Repeater and the input of the next device on the Crown Bus. It will not light unless current can flow in the Crown Bus output circuit from the positive (+) output line back to the negative (-) output line. (The negative output line is effectively a return line to ground.) The LED will not light if the output circuit is open, but it will light if the positive and negative output lines are shorted.

4 Specifications

General

Connectors:

AC Mains: 115-V units supplied with a 3-blade NEMA 5-15p cord. 230-V units require a customer-supplied IEC power cord.

Input Data: One 5-pin female Crown Bus DIN connector.

Output Data: One 4-pin female Crown Bus DIN connector.

Indicators:

Power: This amber front panel indicator lights when the unit is plugged in and receiving power.

Input Status: This green front panel indicator flashes when incoming data is received.

Output Status: This yellow front panel indicator flashes when outgoing data is sent.

Output Continuity: This red back panel indicator shows that the Crown Bus output lines have made a complete circuit.

Power Requirements: 115-V units: 100 to 120 VAC, 50-60 Hz. 230-V units: 220 to 240 VAC, 50-60 Hz.

Power Consumption:

100VAC, 50Hz:	2.4W	100VAC, 60Hz:	2.3W
120VAC, 50Hz:	3.7W	120VAC, 60Hz:	3.0W
220VAC, 50Hz:	3.0W	220VAC, 60Hz:	2.6W
230VAC, 50Hz:	3.4W	230VAC, 60Hz:	2.8W
240VAC, 50Hz:	3.8W	240VAC, 60Hz:	3.0W

Fuse: All models use 1/4 amp fuses.

Finish: Black powder-coated steel chassis and front panel.

Dimensions: 19-inch (48.3-cm) standard rack mount width (EIA RS-310-B), 1.75-inch (4.4-cm) height and 6.5-inch (16.5-cm) depth.

Weight: 4 lb., 6.7 oz.

Crown Bus Data Communication

Data Rate: 38.4 K baud.

Data Format: Asynchronous binary serial data with 1 start bit, 1 stop bit, 8 data bits and no parity check.

Interface Type: Opto-isolated 20-milliamp current loop.

Operation: Half duplex.

Transmission Distance: Variable from 200 to 3,000 feet (61 to 914 meters) depending on wire capacitance. 1,000 feet (305 meters) is typical with shielded 26 AWG twisted pair wire.

5 Service

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:

CAUTION: To prevent electric shock, do not remove covers. No user serviceable parts inside. Refer servicing to a qualified technician.

5.1 Worldwide Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair.

Remember to transport your unit in the original factory pack.

5.2 North American Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

5.2.1 Service at a North American Service Center

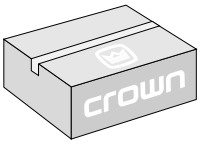
This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A list of authorized service centers in your area can be obtained from our Technical Support Group.

5.2.2 Factory Service

To obtain factory service, fill out the **service information page** that follows and send it along with your proof of purchase and the defective unit to the Crown factory. For warranty service, we will pay for ground shipping both ways in the United States after receiving copies of the shipping receipts. Shipments should be sent "UPS ground." (If the unit is under warranty, you may send it C.O.D. for the cost of freight via UPS ground.) The factory will return it via UPS ground. Please contact us if other arrangements are required.

Factory Service Shipping Instructions:

1. When sending a Crown product to the factory for service, be sure to fill out the service information form that follows and enclose it inside your unit's shipping pack. Do not send the service information form separately.



Always use the original factory pack to transport the unit.

2. To ensure the safe transportation of your unit to the factory, ship it in an original factory packing container. If you don't have one, call or write Crown's Parts Department. With the exception of polyurethane or wooden crates, any other packing material will not be sufficient to withstand the stress of shipping. **Do not use loose, small size packing materials.**
3. Do not ship the unit in any kind of cabinet (wood or metal). Ignoring this warning may result in extensive damage to the unit and the cabinet. Accessories are not needed—do not send the instruction manual, cables and other hardware.

If you have any questions, please call or write the Crown Technical Support Group.

Crown Audio Division
Technical Support / Factory Service
Plant 2 SW, 1718 W. Mishawaka Rd., Elkhart, Indiana 46517 U.S.A.

Telephone: 219-294-8200
800-342-6939 (North America, Puerto Rico, and Virgin Islands only)
Facsimile: 219-294-8301 (Technical Support)
219-294-8124 (Factory Service)
Fax Back: 219-293-9200 (North America only)
800-294-4094 (North America only)
219-294-8100 (International)
Internet: http://www.crownintl.com

Crown Factory Service Information

Shipping Address: Crown International, Inc., Factory Service, Plant 2 SW, 1718 W. Mishawaka Rd., Elkhart, IN 46517
Phone: 1-800-342-6939 or 1-219-294-8200 Fax: 1-219-294-8124

Owner's Name: _____

Shipping Address: _____

Phone Number: _____ **Fax Number:** _____

Model: _____ **Serial Number:** _____ **Purchase Date:** _____

NATURE OF PROBLEM

(Be sure to describe the conditions that existed when the problem occurred and what attempts were made to correct it.)

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Other equipment in your system: _____

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If warranty has expired, payment will be: ❑ **Cash/Check** ❑ **VISA** ❑ **MasterCard** ❑ **C.O.D.**

Card Number: _____ **Exp. Date:** _____ **Signature:** _____

ENCLOSE THIS PORTION WITH THE UNIT. DO NOT MAIL SEPARATELY.

DETACH AND SEND WITH UNIT